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Europäisches Patentamt

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⑪ Publication number:

**0 171 122**  
**A1**

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## EUROPEAN PATENT APPLICATION

⑰ Application number: 85201260.8

⑱ Date of filing: 01.08.85

⑤① Int. Cl.<sup>4</sup>: **C 11 D 7/60, C 11 D 7/26,**  
**C 11 D 7/32, C 23 G 5/036**

⑤③ Priority: 10.08.84 GB 8420329

⑤④ Date of publication of application: 12.02.86  
Bulletin 86/7

⑤④ Designated Contracting States: AT BE CH DE FR GB IT  
LI NL

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⑤④ Designated Contracting States: CH GB LI AT

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⑤④ Designated Contracting States: BE DE FR IT NL

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⑤④ Liquid cleaner.

⑤⑦ Liquid cleaners with excellent shine quality are prepared  
from mixtures of benzylalcohol and EDTA.

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## LIQUID CLEANER

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### Technical Field

Liquid hard surface cleaners with excellent cleaning properties and high "shine" quality are prepared using mixtures of benzylalcohol and ethylenediamine tetraacetate.

### Background

It is well-known to use solvents, surfactants and "builders" (generally, metal ion sequestrants) in liquid hard surface cleaners to promote the cleaning function.

However, equally important to the user of such products is their "shine" quality, i.e., the absence of filming or streaking on surfaces such as glass, stainless steel, mirrors, and the like. Most users tend to equate good cleaning with shine, but this is a mistake. Unfortunately, many cleaning ingredients leave unsightly, streaky deposits on surfaces.

The present invention provides liquid cleaners that are characterized not only by their excellent cleaning properties, but also by their high shine quality.

The compositions herein are particularly suited for cleaning glass, metal (including automobiles), ceramic, high-gloss paint, porcelain, and the like, surfaces where shine quality is important to the user.

#### Summary of the Invention

The compositions herein comprise :

- a) at least 2%, preferably at least 3.0%, ethylenediamine tetraacetate ;
- b) at least 2%, preferably at least 2.5%, benzylalcohol ;
- c) the balance of the composition comprising water as the carrier liquid, and optionally containing deterative surfactants, pH-adjusting agents, additional solvents, hydrotropes, and the like, all as described more fully, herein-after.

All percentages and proportions herein are by weight, unless otherwise specified.

#### Detailed Description of the Invention

The compositions herein are formulated to minimize, or preferably, to be substantially free, of many ingredients commonly disclosed for use in hard surface cleaners. For example, materials such as phosphates, citrates, nitrilotriacetates, gluconic acid and tartaric acid are preferably not used herein because they decrease shine quality. Likewise, nonionic surfactants are kept to a minimum, and the compositions use anionic surfactants at rather low levels (0.5%-10%), generally 0.75%-2%.

The present compositions contain benzylalcohol as a primary cleaning ingredient. The benzylalcohol is optionally, but preferably, used in combination with a "CARBITOL" (Trade Mark), or "CELLOSOLVE" (Trade Mark) solvent. The carbitol solvents are of the 2-(2-alkoxyethoxy) ethanol class, and the cellosolves are of the 2-alkoxyethanol class. The cellosolves are, generally, a little less soluble in water than the carbitols, but they can be solubilized using hydrotropes. Preferred for use herein are Butyl Carbitol, Trade Mark for 2-(2-butoxyethoxy) ethanol, and hexylcellosolve

The carbitol and cellosolve solvents preferably comprise at least 0.5%, generally 1%-5%, of the present compositions.

The compositions herein also preferably contain a water-soluble anionic surfactant, especially the  $C_{10}-C_{18}$  paraffin sulfonates and the  $C_{10}-C_{14}$  alkylbenzene sulfonates, with the latter being preferred.

As mentioned, nonionic surfactants may be used in modest amounts, but the levels are generally kept below 1%, generally about 0.2%. Nonionics can decrease shine performance, and since they are primarily used for greasy soil removal - a function which the benzylalcohol performs exceptionally well - the typical ethoxylated alcohol or phenol nonionic surfactants are kept to a minimum.

The compositions herein are formulated at a pH in the range 9.5-11, preferably 10.3-10.8, most preferably 10.7. Materials such as sodium hydroxide, sodium carbonate, and the like, can be used to adjust pH.

The compositions herein can contain various colorants, bactericides, perfumes, suds control agents such as fatty acids and soaps, and the like. Generally, usage levels of such optional ingredients are in the range of 0.02% to 1%.

Apart from the benzylalcohol, the second key ingredient in the present compositions is ethylenediamine tetraacetate ("EDTA"), which can be used in any of its water-soluble salt forms, such as the tetrasodium (preferred), trisodium, disodium, or other soluble alkali metal or ammonium salt forms, or mixtures thereof. The EDTA appears to co-act in some way with the benzylalcohol to provide good cleaning and exceptionally high shine quality in a manner not shown by other sequestrants such as citrates, nitrilotriacetates, and the like. The reason for this unique performance is not understood and is totally unexpected.

The compositions herein are preferably formulated as homogeneous liquids, so a hydrotrope (1%-5%) is generally used to ensure homogeneity. Sodium cumene sulfonate is a preferred hydrotrope, but hydrotropes such as the toluene-and-xylene-sulfonates may also be used, according to the desires of the formulator.

Industrial Application

The following is a non-limiting example of a highly preferred hard surface cleaner of the type encompassed by the present invention and formulated within the range of preferred compositions of the general type :

i) Ethylenediamine Tetraacetate	3% - 6%
ii) Benzylalcohol	2.5% - 6%
iii) Butyl Carbitol	1% - 5%
iv) Alkyl Benzene Surfactant	0.75% - 2%
v) Hydrotrope	1% - 5%
vi) Water and Minors	Balance
pH (product "as is")	10 - 11

EXAMPLE I

<u>Ingredients</u>	<u>Percent by Weight</u>
C <sub>11.8</sub> Alkyl Benzene Sulfonate (Na)	1.0
Ethoxylated (E07) C <sub>13-15</sub> Alcohol	0.2
Coconut Fatty Acids	0.044
Sodium Carbonate	4.0
EDTA (as Na <sub>4</sub> salt)	4.0
Benzylalcohol	3.7
Butyl Carbitol	2.4
Sodium Cumene Sulfonate	2.4
Water/NaOH to pH 10.7	Balance

The composition of Example I is prepared by mixing the indicated ingredients. The resulting composition gives excellent results in both hard surface cleaning and shine. The composition may be used "as is", or may be diluted in water, according to the desires of the user.

The compositions herein may also be formulated to contain an abrasive. Typical abrasives include water-insoluble powdered materials such as talc, calcium carbonate, pumice, melamine-urea-formaldehyde resin, polyethylene, methacrylate resin, polyvinylchloride, and the like. Typically, abrasives have a particle size range of 10-1000 microns and are used at concentrations of 10% to 30% in the compositions. Thickeners may be added to suspend the abrasives.

CLAIMS

1. A hard surface cleaner in liquid form, comprising at least 2% ethylenediamine tetraacetate and at least 2% benzylalcohol.

2. A composition according to claim 1 which also comprises 0.75%-2% anionic surfactant.

3. A composition according to claim 2 which also comprises 1%-5% of a carbitol or cellosolve solvent.

4. A composition according to claim 3 which also contains 1%-5% of a hydrotrope.

5. A composition according to claim 4 which is formulated at pH 9.5-11.

6. A composition according to any of the foregoing claims which is substantially free of phosphates, citrates, nitrilotriactates, gluconic acid or tartaric acid.

7. A composition according to any of the foregoing claims which contains less than 1% nonionic surfactant.

8. A composition according to any of the foregoing claims which contains an abrasive.





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## EUROPEAN SEARCH REPORT

0171122

Application number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 85201260.8
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 4)
A	<u>DE - B - 1 073 273</u> (HENKEL & CIE, G.M.B.H.) * Examples 1-4 * --	1,5	C 11 D 7/60 C 11 D 7/26 C 11 D 7/32 C 23 G 5/036
A	<u>FR - A - 1 413 721</u> (J.R. GEIGY S.A.) * Example 1; claim 2, paragraphs d,f * --	1,5	
A	<u>GB - A - 1 493 582</u> (KOLENE CORPORATION) * Page 2, line 30; claim 1, paragraph (b); claim 5 * --	1,5	
A	<u>US - A - 4 048 121</u> (E.H. CHANG) * Examples 1-5; claims 1,3 * --	1,5	TECHNICAL FIELDS SEARCHED (Int. Cl. 4)
A	<u>EP - A1 - 0 080 749</u> (THE PROCTER & GAMBLE COMPANY) * Examples 1,3; claims 1,6,7,8, 12 * -----	1-5	C 11 D C 23 G
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 15-10-1985	Examiner REISER
<b>CATEGORY OF CITED DOCUMENTS</b>			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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